

## **2012 Census of Governments: Employment Methodology**

The survey measures the number of federal, state, and local civilian government employees and their gross payrolls for the pay period including March 12, 2012.

The U.S. Census Bureau currently produces the Census of Governments quinquennially for the years ending in “2” and “7”. For 2012, all of the over 90,000 state and local governments were surveyed.

### **Population of Interest**

The population of interest for this survey includes the civilian employees of all the Federal Government agencies (except the Central Intelligence Agency, the National Security Agency, and the Defense Intelligence Agency), all agencies of the 50 state governments, and 90,690 local governments (i.e., counties, municipalities, townships, special districts, and school districts) including the District of Columbia.

### Content of the Survey

The survey provides state and local government data on full-time and part-time employment, part-time hours worked, full-time equivalent employment, and payroll statistics by governmental function (i.e., elementary and secondary education, higher education, police protection, fire protection, financial administration, central staff services, judicial and legal, highways, public welfare, solid waste management, sewerage, parks and recreation, health, hospitals, water supply, electric power, gas supply, transit, natural resources, correction, libraries, air transportation, water transport and terminals, other education, state liquor stores, social insurance administration, and housing and community development).

The survey provides Federal Government data on total employees, full-time employees, and total March payroll by governmental function. There is no detail available for part-time employment, part-time hours worked, full-time equivalent, or full-time or part-time employee payrolls. Three functions apply only to the Federal Government and have no counterpart at the state and local government levels: national defense and international relations, postal service, and space research and technology.

The questionnaires that were used to collect these data can be viewed at [<GET FORMS>](#) on the Government Employment and Payroll Website.

Critical definitions include the following:

Employment: Employment refers to all persons gainfully employed by and performing services for a government.

Employees: State and local government employees include all persons paid for personal services performed, including persons paid from federally funded programs, paid elected or appointed officials, persons in a paid leave status, and persons paid on a per meeting, annual, semiannual, or quarterly basis. Unpaid officials, pensioners, persons whose work is performed on a fee basis, and contractors and their employees are excluded from the count of employees. For federal employees, employee counts are the on-board "head count" as of the end of the report period. The data collected for this survey include all federal civilian employees, including seasonal and intermittent employees, and employees on foreign assignments residing outside the 50 states and the District of Columbia. Employees of the Central Intelligence Agency, the National Security Agency, and the Defense Intelligence Agency are not included in any of the data presented by government function. Federal judges, members of Congress and their staffs, employees of the Congressional Budget Office, and elected (with the exception of the President) and appointed officials of the Executive Branch are included. Employees of non-appropriated funds of defense activities are not classified as federal employees; therefore, they are excluded.

Full-time employees: Full-time employees are defined to include those persons whose hours of work represent full-time employment in their employing government.

Part-time employees: Part-time employees are those persons who work less than the standard number of hours for full-time work in their employing government.

Full-time equivalent: Full-time equivalent (FTE) is a computed statistic representing the number of full-time employees that could have been employed if the reported number of hours worked by part-time employees had been worked by full-time employees. This statistic is calculated separately for each function of a government by dividing the "part-time hours paid" by the standard number of hours for full-time employees in the particular government and then adding the resulting quotient to the number of full-time employees.

Payroll: Payroll amounts represent gross payrolls for the 1-month period of March (31 days). The gross payroll includes all salaries, wages, fees, commissions, bonuses, or awards paid to employees during the pay period that includes the date of March 12. Payroll amounts reported for a period other than 1-month are converted to represent an amount for the month of March. All payroll figures are represented in current whole dollars and have not been adjusted for inflation.

Conversion of a reported payroll to a payroll amount that would have been paid during a 31-day month is accomplished by multiplying the reported payroll by an appropriate factor. For example, a 2-week payroll is multiplied by 2.214, a 1-week payroll is multiplied by 4.429, and a twice-a-month payroll is multiplied by 2.000.

Part-time hours: These data represent the number of hours worked by part-time employees during the pay period. Note: These data are not collected for publication but rather are used to calculate full-time equivalent employment data.

## **Data Collection**

### Confidentiality

The data that are collected in this survey are public record and are not confidential<sup>1</sup>.

### Dates of Collection

The following are important dates in the data collection process:

03/2012	Advanced postcard
03/2012	Initial mail-out
05/2012	Reminder letter mail-out
06/2012	Follow-up mail-out
03/2014	Preliminary release to Census Bureau Internet
04/2016	Revisions released to Census Bureau Internet

### Methods

Data in these files are based on information obtained in the Survey of Public Employment and Payroll. Census Bureau staff compiled Federal Government data from records of the U.S. Office of Personnel Management. Forty-six of the state governments provided data from central payroll records for all or most of their agencies/institutions. Data for agencies and institutions for the remaining state governments were obtained by mail canvass questionnaires. Local governments were also canvassed using a mail questionnaire. However, elementary and secondary school system data in Florida and North Dakota were supplied by special arrangements with the state education agency in each of these states. Additionally, in Delaware, a state government respondent supplied data for school districts. All respondents receiving the mail questionnaire had the option of completing the survey using a web-based survey instrument developed for reporting the data. The online survey instrument was completed by 24.4% of the state-level responding units and 49.5% of the local government respondents.

## **Data Processing**

### Editing

Editing is a process that tries to ensure the accuracy, completeness, and consistency of survey data. Efforts are made at all phases of collection, processing, and tabulation to minimize reporting, keying, and processing errors.

Although some edits are built into the Internet data collection instrument and the data entry programs, the majority of the edits are performed post collection. Edits

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<sup>1</sup> Title 13, United States Code, Section 9(b).

consist primarily of two types: (1) *consistency edit* and (2) a *ratio edit*.

The *consistency edits* check the logical relationships of data items reported on the form. For example, if a value exists for employees for a function then a value must exist for payroll also. If part-time employees and payroll are reported then part-time hours must be reported and vice versa.

For each function reported for the employees, the *ratio edits* compare data for the number of employees and the average salary between reporting years. If data fall outside of acceptable tolerance levels, the item is flagged for review.

For *ratio edits* and *consistency edits*, the edit results are reviewed by analysts and adjusted as needed. When the analyst is unable to resolve or accept the edit failure, contact is made with the respondent to verify or correct the reported data.

#### Imputation

Not all respondents answer every item on the questionnaire. There are also questionnaires that are not returned despite efforts to gain a response. Imputation is the process of filling in missing or invalid data with reasonable values in order to have a complete data set for estimating state and national totals.

For nonresponding general purpose governments, dependent and independent school districts, and for special district governments, the imputations were based on recent historical data from either a prior year annual survey or the 2007 Census of Governments: Employment Component, if available. These data were adjusted by a growth rate that was determined by the growth of responding units that were similar (in size, geography, and type of government) to the nonrespondent. If there were no recent historical data available, the imputations were based on the data from a randomly selected responding donor that was similar (based on the same criteria) to the nonrespondent. For general purpose governments, and for dependent and independent school districts, the selected donor's data were adjusted by dividing each data item by the population (or enrollment) of the donor and multiplying the result by the nonrespondent's population (or enrollment).

#### Tabulation

After the data were edited and imputed, the 2012 Census of Governments: Employment data were aggregated to yield the viewable and downloadable files that are available on the Website. In the publications for employment statistics, full-time employees, full-time pay, part-time employees, part-time pay, full-time equivalent employment, and total March pay are published.

#### Sampling Variability

The data for the census are not subject to sampling and do not contain sampling error. The user should be mindful that the data for years not ending in '2' or '7'

are from sample surveys and are subject to sampling error. Discussions of sampling error are available in the survey methodology descriptions for those years. For any comparisons of census year data to a sample year, the data user must perform hypothesis tests using the survey year's sampling errors. For the census year, the sampling error is zero.

## **Data Quality**

### **Nonsampling Errors**

Although every effort (as described in the Data Processing section) is made in all phases of collection, processing, and tabulation to minimize errors, the sample data are subject to nonsampling errors (such as, inability to obtain data for every variable from all units in the sample, inaccuracies in classification, response errors, misinterpretation of questions, mistakes in keying and coding, and coverage errors). These same errors may be evident in census collections and may affect the Census of Governments data used to adjust the sample during the estimation phase and used in the imputation process.

### **Modal Distribution**

Each respondent that received a mail questionnaire had the option of returning the paper questionnaire, reporting data using a collection instrument, or working directly with staff members to report over the phone, fax or email. In addition, some governments have developed alternative reporting arrangements, known as central collection. The following table shows the response distribution by mode for state and local governments that reported to the Annual Survey of Public Employment and Payroll.

	<b>State Governments</b>	<b>Local Governments</b>
<b>Web</b>	24.4%	49.5%
<b>Paper</b>	9.3%	39.3%
<b>Central Collection</b>	64.9%	0.6%
<b>Other</b>	1.4%	10.6%

### **Overall Unit Response Rate**

The overall unit response rate to the 2012 Census of Governments, Survey of Public Employment and Payroll was 77.7 percent. All of the 50 state governments responded to the survey. Although the unit response rates are well above the 60 percent Census Bureau's quality standard for most states, New Mexico, at the local and the state & local government levels, fell below this standard.

## Total Quantity Response Rate

The Total Quantity Response Rate (TQRR) is the percentage of the tabulated total obtained from directly reported and equivalent quality data. It is calculated separately for each state and key variable, where the key variables for the survey are total employment and total payroll. The TQRR is computed as the weighted sum of the respondent data divided by the weighted sum of the respondent and imputed data. This result is then multiplied by 100. Files of the unit response rates and TQRR's for all states are available in the Response Rate Tabulations section below.

The Census Bureau's quality standard on releasing data products requires a 70 percent TQRR for the key variables. However, the state and local tabulations of Massachusetts, New Hampshire, South Dakota, and Washington failed to meet the 70 percent TQRR standard for at least one of the key variables.

For the state governments, there are three states (Maryland, Missouri, and Nebraska) that are noncompliant for at least one TQRR key variable.

For the local governments, there are eleven states (Connecticut, Louisiana, Massachusetts, Michigan, Mississippi, Montana, New Hampshire, New Jersey, South Dakota, Vermont, and Washington) that are noncompliant for at least one TQRR key variable.

## Response Rate Tabulations

[State & Local Response Rates](#) [TXT, 4KB] – Unit Response Rates and Total Quantity Response Rates (TQRR's), by state, for state and local governments combined

[State Response Rates](#) [TXT, 4KB] – Unit Response Rates and Total Quantity Response Rates (TQRR's), by state, for state governments

[Local Response Rates](#) [TXT, 4KB] – Unit Response Rates and Total Quantity Response Rates (TQRR's), by state, for local governments

Response Rate Notice for the 2012 Census of Governments: Employment - (Please read [this notice](#) concerning the Government Response Rates) – [PDF, 268KB]

For Further Information:

Barth, Joseph, Yang Cheng, and Carma Hogue. "[Reducing the Public Employment Survey Sample Size](#)," Joint Statistical Meetings, 2009

Cheng, Yang, Casey Corcoran, Joseph Barth, and Carma Hogue. "[An Estimation Procedure for the New Employment Survey Design](#)," Joint Statistical Meetings, 2009

Cheng, Yang, Eric Slud, and Carma Hogue. "[Variance Estimation for Decision-Based Estimators with Application to the Annual Survey of Public Employment and Payroll](#)," Joint Statistical Meetings, 2010

Tran, Bac and Brian Dumbacher. "An Evaluation of Different Small Area Estimators for the Annual Survey of Public Employment and Payroll," Joint Statistical Meetings, 2014

Tran, Bac and Yang Cheng. "[Application of Small Area Estimation for Annual Survey of Employment and Payroll](#)," Joint Statistical Meetings, 2011